

CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the major findings and the contribution of the present study are summarized. The limitations of the study and suggestion for areas of further research are also enumerated. The study at the end outlines a roadmap for the future.

The broad conclusions of the research are as follows.

Objective 1: To study the status of Indian Power sector before and after reforms in India

The Central and State governments have taken several initiatives to reform the power sector in the last decade. The reforms have been undergone in different stages - of the early years of minimal regulation to State-dominated industry and old-style regulation to commercialization and new style regulation. The focus has shifted from generation capacity addition to a more comprehensive reform approach with emphasis on SEB restructuring, unbundling, corporatisation and rationalization of tariffs through establishment of regulatory commissions and carry out reforms leading to privatization of distribution. The traditional of vertically integrated, state-owned monopolies changed and the conceptual legislation underlying the new legislation changed to Competition.

The strategic shift in power sector regulation and reforms in Indian Power Sector could be classified into five phases as shown in chapter 8 (Exhibit No. 8.1 and 8.2). Power sector reform, which entails independent regulatory commission, unbundling of the State Electricity Boards (SEBs) and eventual privatization especially of distribution, has been the dominant theme in the Indian economic policy discourse during the later part of the 1990s.

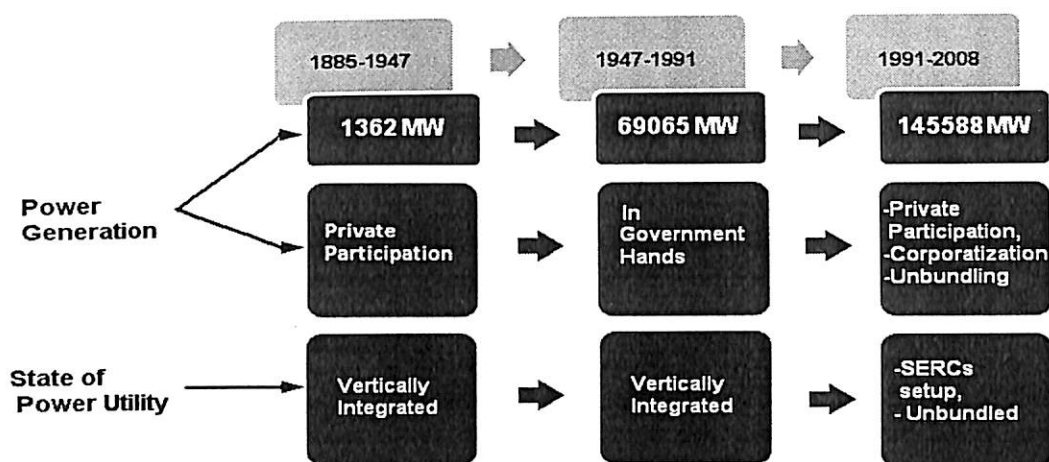
Reforms have started in early 90s i.e. the fourth phase where the sector was opened to private participation and regulatory commissions were established at Center and State. In Phase-5 Government's focus shifted on to state utilities with main thrust on distribution reforms. State utilities were unbundled and legal support was provided to reforms through the Electricity Act-2003.

Post reform strategic shift can be summarized as:

- Sector opened to Pvt. participation with liberal incentives.
- Main focus of Govt. shifted on state utilities for power generation.
- Thrust on Distribution Reforms.
- Thrust on Commercialization
- Reform & unbundling of state utilities.
- SERC set up and unbundling and privatization of state utilities
- Customer has come to occupy the centre stage of the marketing activity
- Number of players is higher than ever.

The changes over the years can be categorized as shown in exhibit below.

Exhibit No 9.1: Periodical changes in the power sector in India



The reform process in the Power Sector has been progressing to bring more competition and transparency in line with the market forces. An important feature of the process is that the policy reform underway in India is gradualist. Much of the gradual structural reform focused on state-owned enterprises as they accounted for a large fraction of economic activity and were particularly inefficient. Although, with the setting up of the State Electricity Regulatory Commissions, an attempt has been made to rationalize tariffs and more importantly to insulate the SEBs from the state governments, it would still take considerable time before the process starts yielding results. Reforms need to be pursued in a framework of macroeconomic stability. Power Sector Reforms reflects that it was expected that the action plan outlined in the preceding

chapters has led to improvement in the operational and financial performance of the State Electricity Boards/Utilities. In future the Indian power sector should implement accelerated power reforms, especially in distribution sector emphasizing on quality of service and its return to commercial viability.

Objective 2A: Parameterization and measuring performance of Power Distribution companies in Delhi against the identified Quality of service parameters for operating efficiency and reliable power from the consumer point of view during 2000-2007.

Our analysis and findings based on the secondary data and information available in the public domain borne out the fact that at this initial stage of reforms, it is crucial that the distribution utilities and regulatory commissions show serious end to end commitment in the QoS process.

Quality of Service gained prominence among the policy makers, competitive utilities, consumers and regulators lately all around the world. It gained importance in parallel with the reforms process. Quality of Service became an imminent need for regulation, as quality of service is a major concern for consumers also. Hence, apart from reliability QoS gained prominence in the early 90s in countries which are undergoing reforms.

UK pioneered QoS regulations by being the first country to ensure quality of service through price regulation while in USA it took different forms in different states through both price and profit regulation. South Africa, being a developing country and facing problems similar to that of Indian Power Sector, shows the path for QoS regulation. The study of QoS regulations of these countries provide valuable lessons for countries under different development stages and electricity markets under different regulatory systems.

After reviewing the earlier studies, it is concluded that the intangible electricity should be earmarked with tangible components to judge the level of quality and benefits being received to the end consumers. In order to judge / depict the level of quality of service to the consumer can be broadly categorized for depicting quality of service into the following parameters:

Parameterization of identified Quality of service parameters

a. Operational Parameters

i. Technical Parameters

- Voltage
- Reliability
- Overloading of Power Equipments
- Capacity Utilization and Enhancement

ii. Standard of Performance

- Consumer Complaint handling
- No. of Consumer Complaints
- New Connections/ Energisation
- Hours of Supply
- Level of Consumer awareness to the regulations like Electricity Act 2003 and Supply Code

b. Commercial Parameters

i. Meter reading

- Frequency and adherence to the time schedule of Meter reading
- No. of Faulty & Stopped Meters
- Usage of Advance Meter Reading Technology
- Spot Billing of Consumers having Faulty/ tampered Meter

ii. Billing

- Adherence to Time Schedule of Dispatch of Bills
- No. of Complaints for duplicate Bills
- No. of Complaints of Faulty Bills

iii. Collection efficiency

c. Dispute Resolution

i. Presence of CGRFs and at which level (Circle/ Division/ Sub-Division)

ii. Awareness of CGRFs and its working among Consumers

iii. Performance of CGRFs

- No. of members and their profiles.
- No. of independent members
- No. of cases registered vs. no. of cases resolved
- No. of cases in which compensation was being paid to appellant.

Arriving at a right mix of performance indices with the optimum level of detail that can be supported by data and a monitoring system that will facilitate transparency, accountability & participation which help in the turnover of the utility. Therefore, regulatory measures to improve Quality of service are necessary and welcome steps helping the consumer to get better service from the utility.

2.A.2: Measurement of the identified performance parameters of power distribution companies in Delhi

The performance parameters have been analyzed for measuring the performance of power distribution companies in the Pre and Post reforms period.

The performance parameters analyzed have been categorized as follows:

D. Technical Parameters

- Transmission and Distribution (T&D) Losses in Delhi Power System
- Transformer Failure Rate

E. Commercial Parameters

- Collection Efficiency
- Aggregate Technical and Commercial Losses
- Average Cost of Supply
- Average Revenue Realisation
- Receivables

F. Operational Related to Quality of service

- Peak Load Met
- Extent of Load Shedding

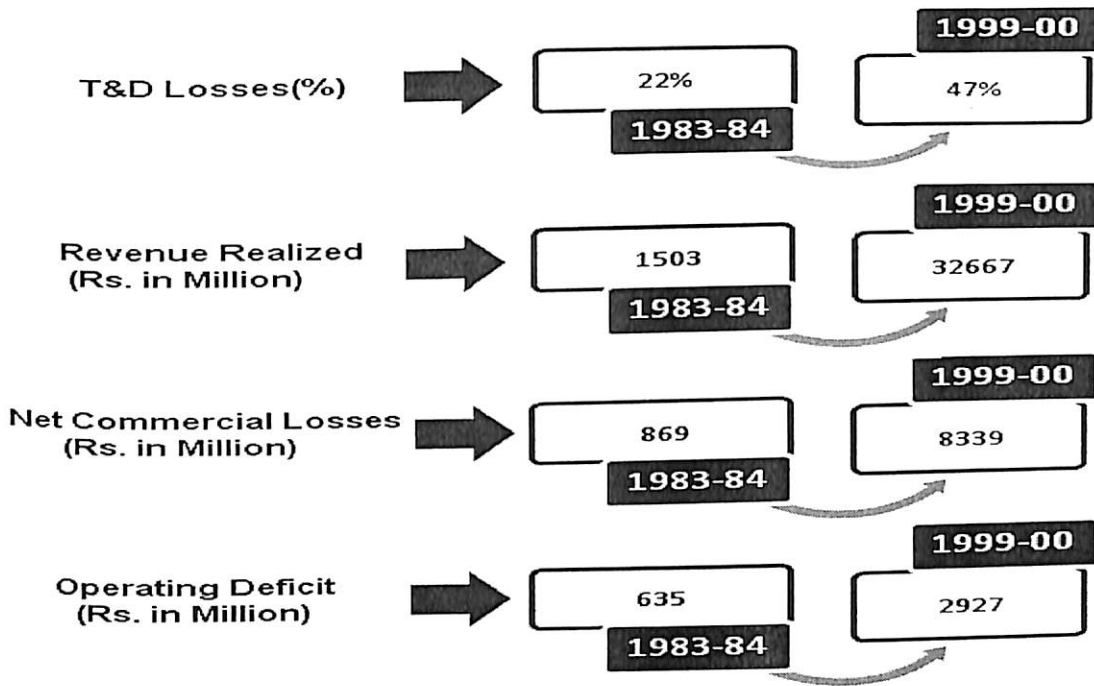
Pre-Post Reform Technical and Commercial Performance of Delhi Power Sector

A. Technical Parameters

Analysis of the above parameters concludes that DESU / DVB during 19990's suffered a very poor public image for its quality of service, consumer relations and commercial performance. The high T&D losses

and collection inefficiency were two of the major concerns of the Delhi power sector prior to reforms. The T&D losses in 1984 were to the tune of 22% which peaked to 47% by 2000. However even when, down to the early 1990s, DESU's T&D losses were at relatively acceptable levels, the retail tariff was insufficient to cover its costs and DVB was unbundled in 2002. The technical and commercial performance in Delhi is as shown below.

Exhibit No. 9.2: Technical and Commercial Performance of Delhi



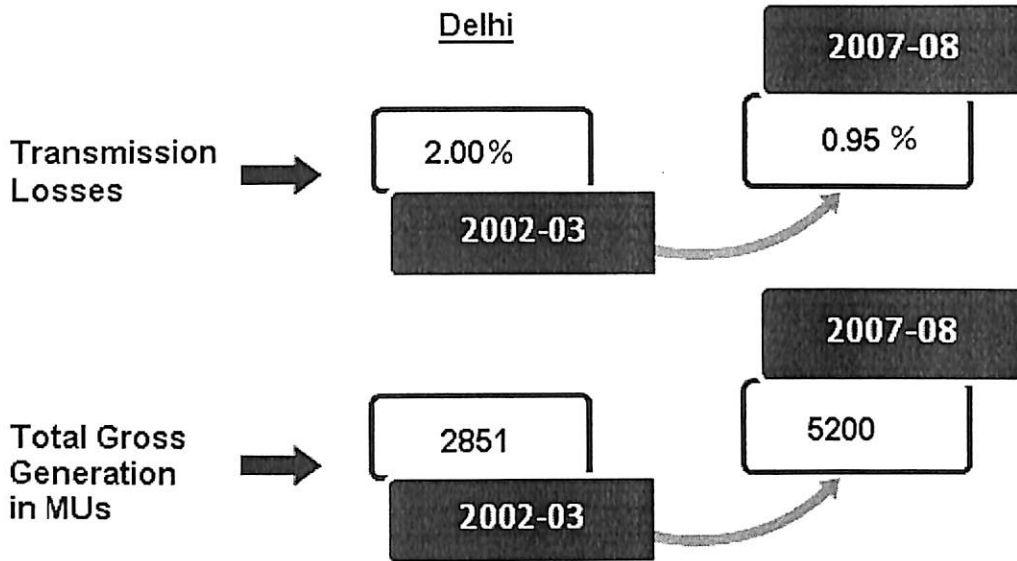
Post Reform Technical and Commercial Performance of DISCOMs

The analysis of the technical, commercial and operational parameters makes it evident that reforms in Delhi have led to a significant improvement in the quality of service and loss levels have been significantly reduced, it is effective step towards success.

The bidding criteria adopted for privatization of distribution business was the reduction in Aggregate Technical and Commercial Losses (a combination of T&D losses and Collection Efficiency). The overall T&D losses of Delhi Power Sector prior to reforms were in the range of around 46-47%, which has reduced to around 28.45% at the end of FY 2007-08. Across all the technical and commercial parameters of in all the three DISCOMs there is a considerable improvement after privatization but not to the extent to silence

critics. Transmission losses have decreased from 2% in 2003 to 0.95% in 2007. Also the number of Distribution Transformer (DTRs) failures during the year has reduced significantly from 1533 in FY 2002 during pre-reforms period to 27 in FY 2006 during the post reforms period as shown below.

Exhibit No. 9.3: Post reforms: Operational and Technical Parameters in Delhi



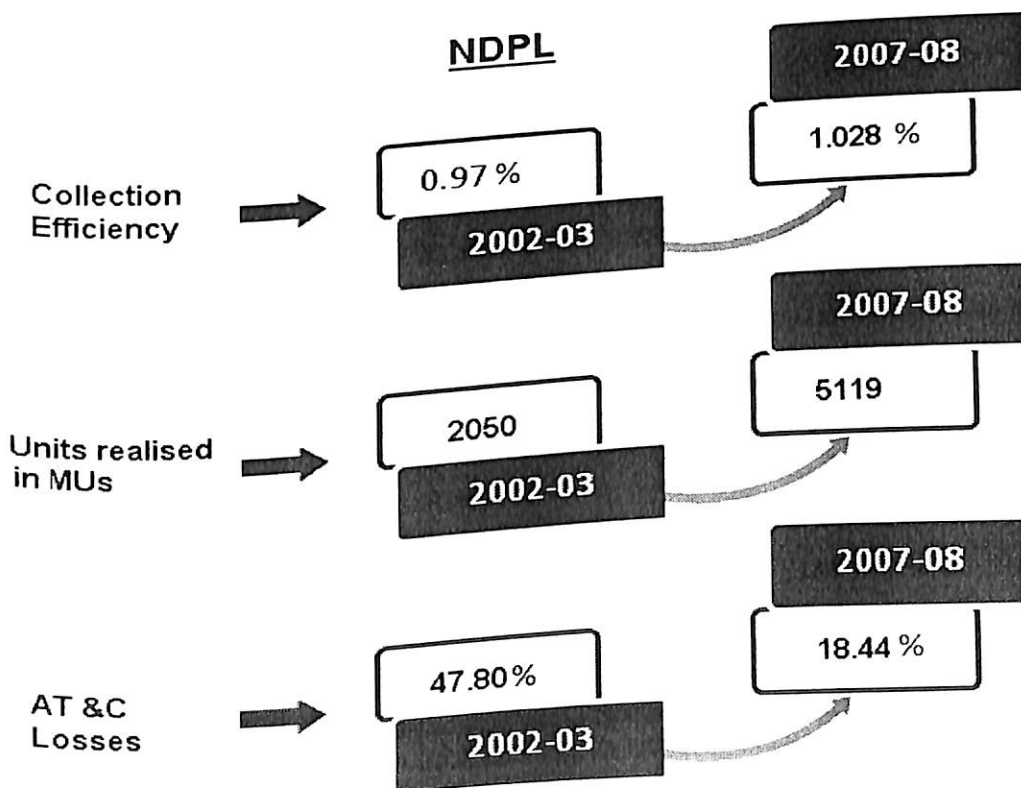
The problem in pre reform period was that SEBs were losing money not because they were not producing enough power, but they were not charging enough and collecting even less. They were losing more than one-third of the power they produced, or purchased, to theft and pilferage. The major improvement over the above parameters is concluded as:

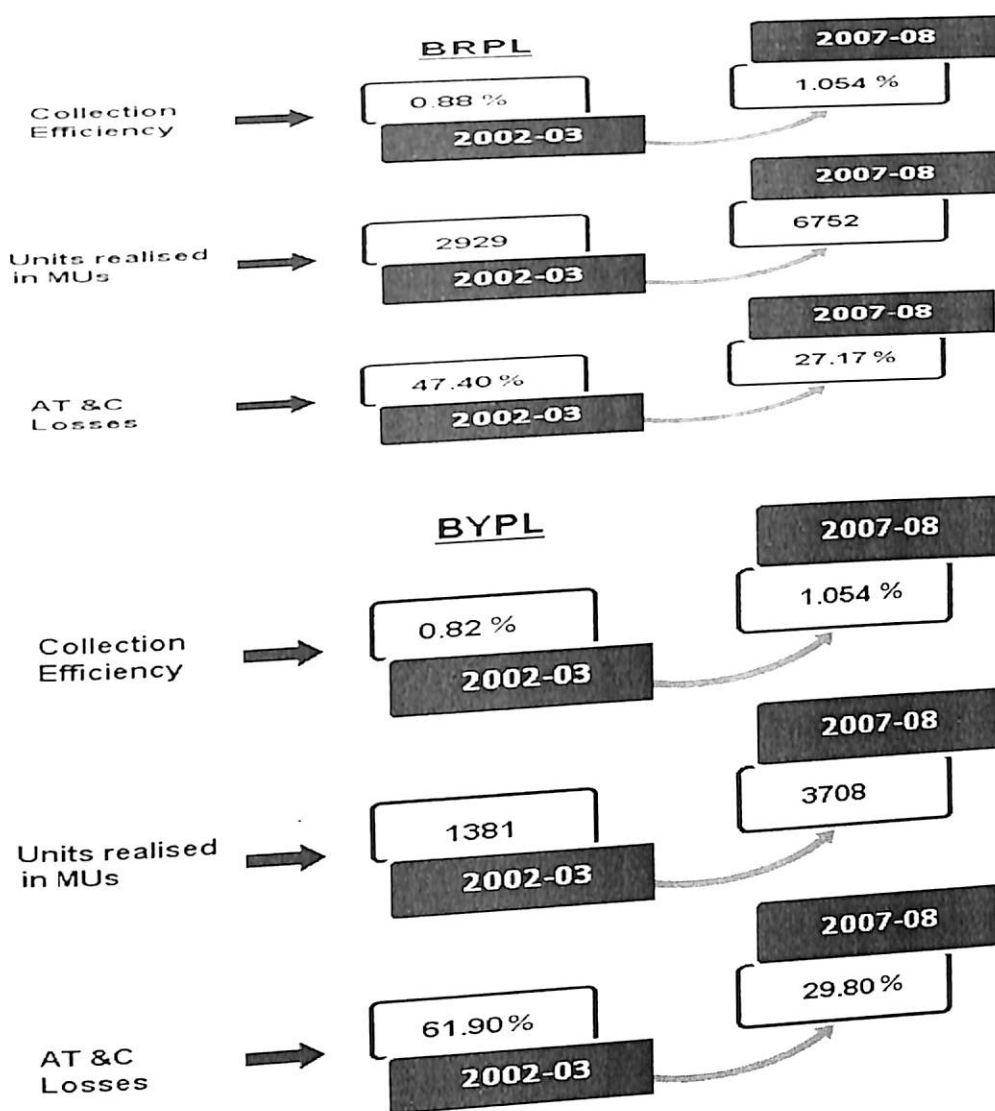
- The Peak demand in Delhi has ranged between 3097 MW in 2002-03 to 42000 MW 2007-08 and with the total installed capacity with IPGCL and PPCL of approximately 994.5 MW, Delhi is highly dependent on other sources including Central Generating Stations to meet its power requirement. The performance of IPGCL and PPCL has been analyzed against key parameters since July 2002, the effective date of Transfer Scheme. The Gross generation for the Delhi stations has grown from 5019 MU in 2003-04 to 5200 MU in 2006-07. Coal based IP station has shown an improvement while Rajghat station has shown a reduction in the energy generated. Gas based stations, i.e., the Gas turbine station of IPGCL and PPCL have shown an impressive increase in the energy produced. This is

because of the improved PLF for the Gas stations. All the stations have performed consistently over the years and have maintained same levels of auxiliary consumption.

- As per the Station Heat Rate (SHR) is concerned, the IP station and the Rajghat stations have an SHR of more than 3300 kCal/kWh, which can be attributed to the vintage of the plants. IPGCL has however improved SHR for Rajghat station as is evident from the data submitted by it to the Commission. Even for the Gas turbine station of IPGCL, the SHR has deteriorated for FY 2006-07 as compared to FY 2002-03. The high value of SHR for PPCL in 2002-03 was due to the fact that 2002-03 was the stabilization period and the plant was fully commissioned only by March 2003.
- The Distribution Companies have been pursuing an aggressive capital expenditure (Capex) program since the infrastructure inherited from the erstwhile Delhi Vidyut Board (DVB) There has been sufficient addition to the infrastructure such as power transformers, EHV cables, installation of distribution transformers, installation of 11kV feeders, installation of shunt capacitors, etc. by the Distribution Companies and corresponding augmentation of Grid & Grid stations has been undertaken by DTL. The commercial performance of the three DISCOM are as follows.

Exhibit No 9.4: Commercial Performance of DISCOMs





- The study has led to the conclusion that the TRANSCO has been constantly upgrading its infrastructure to ensure that the consumers of Delhi are supplied uninterrupted power without many breakdowns. Over the period from FY 2002-03 to FY 2006-07 TRANSCO has invested a sum of Rs.365.63 crore to strengthen and upgrade its network.
- Various steps are being taken by the TRANSCO and DISCOMs to strengthen the transmission, sub-transmission and distribution system in view of the continuously rising demand.

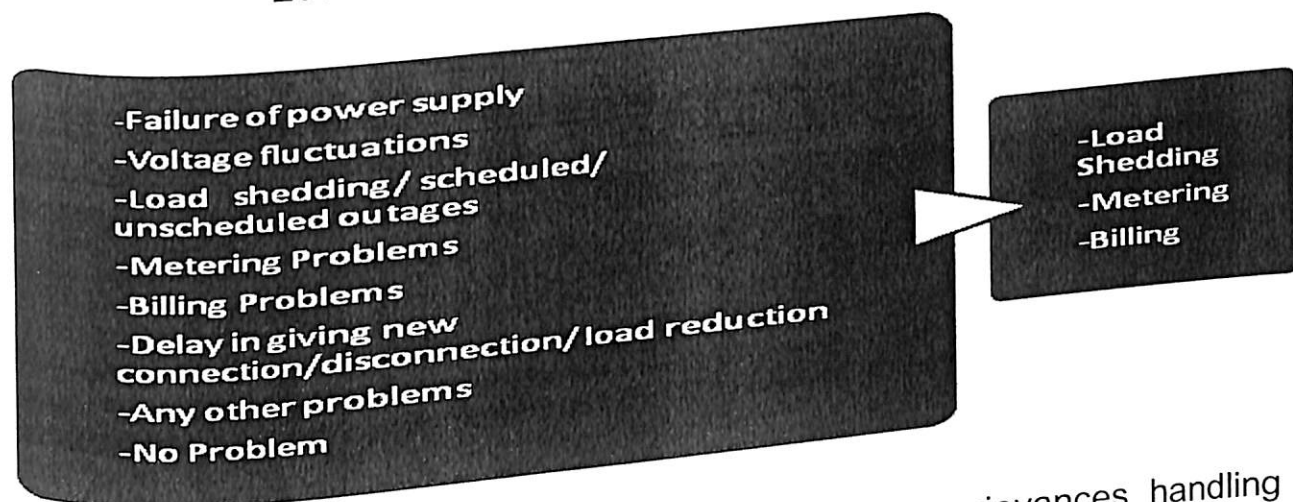
The analysis of the technical, commercial and operational parameters makes it evident that reforms in Delhi have led to a significant improvement in the above parameters and which has led to improvement in quality of service, collection efficiency and loss levels have been significantly reduced which is effective step towards success.

Objective 2b. Measuring performance of Power distribution companies in Delhi against the Quality of Service performance parameters during 2000-2007 from the consumer point of view.

As per the analysis in chapter 8, a total of 1002 consumers were surveyed across all 3 DISCOMs. Primary data has been gathered based on questionnaire which includes various Quality of Service parameters.

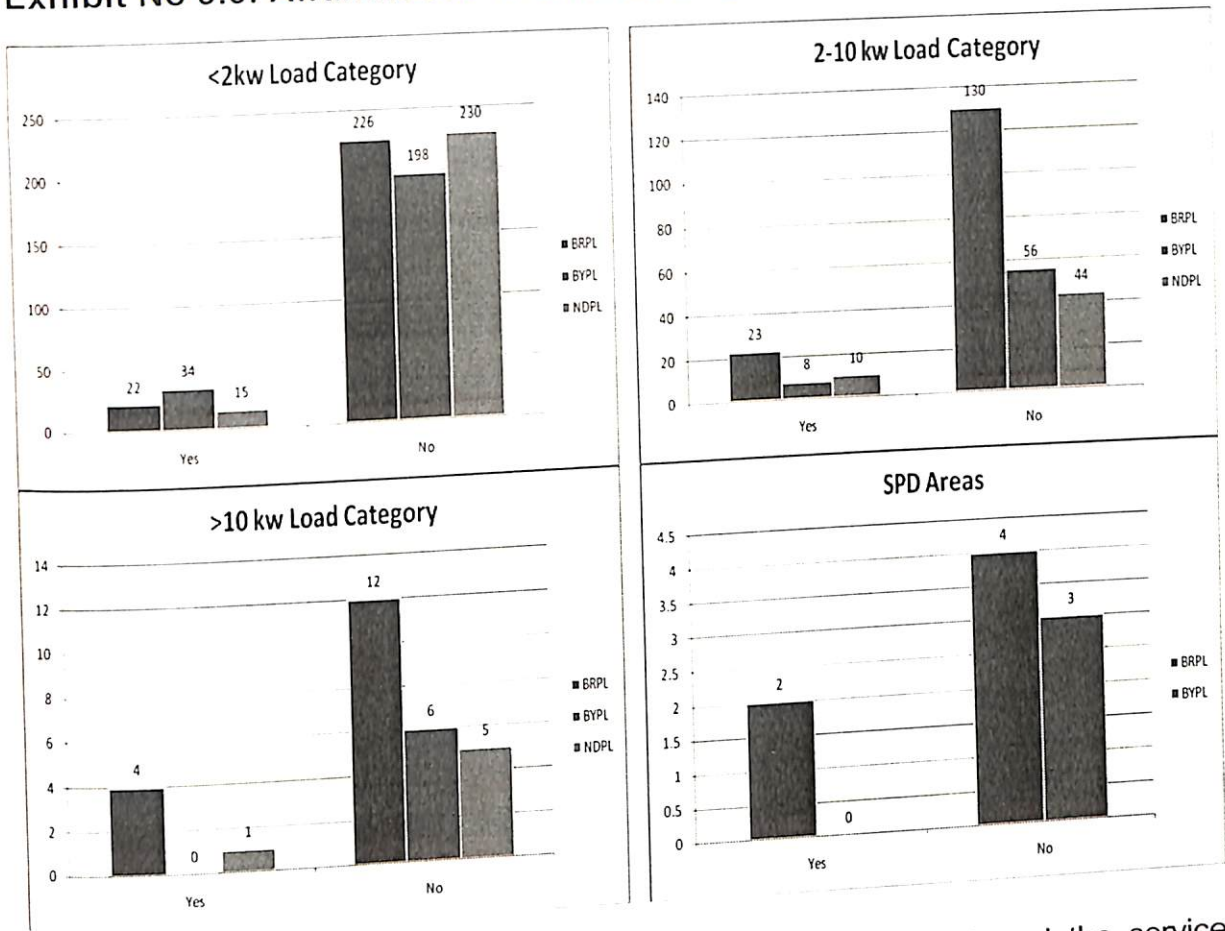
As an outcome of that exercise, the research validates the power distribution reform process undertaken in the light of the profile of the consumers who responded to the survey, followed by an assessment of their satisfaction level with respect to key 'service' parameters, redressed mechanism that exists and the extent to which the same is used for addressing 'utility' concerns. The consumer is facing the problems related to Load Shedding, Concern of Metering and billing although the DISCOMs has shown better performance with respect to the efficiency parameters i.e. reduction in T&D losses, collection efficiency etc as analyzed in objective 2.A and shown below.

Exhibit No. 9.5: Power Related Problems Mentioned by Consumers by Load Category



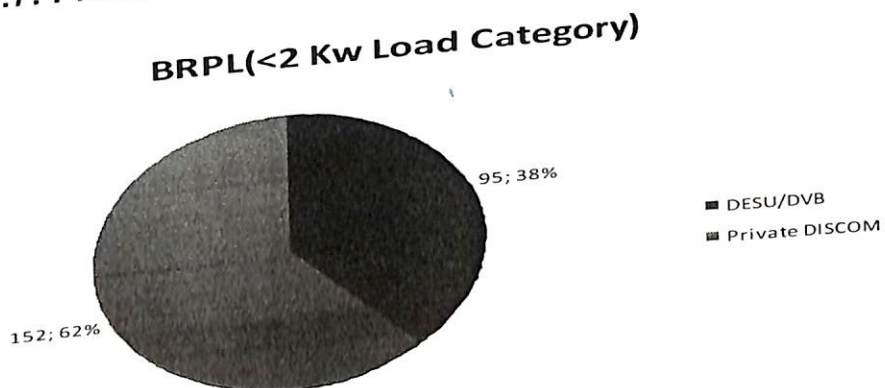
- The consumers were not much aware about the grievances handling mechanism which have been put in place in form of Discom-wise Consumer Grievances Redressal Forums (CGRFs) and the Appellate Institution of the Electricity Ombudsman. The awareness about DERC among consumers was also not much across different load category of consumers as shown in Exhibit No 9.6.

Exhibit No 9.6: Awareness of DERC among Different Load Categories



- It is concluded from the survey that the consumers preferred the services rendered by the Discoms over those of the erstwhile DESU/DVB. There is an urgent need to ensure sustainable improvement in the quality of service. More efforts are required to improve the overall satisfaction levels of the consumers with respect to the utility at a generic level and the respective DISCOM and redressal mechanism(s) at a specific level. Exhibit 32 presents a graphic shot of the configuration of reform exercise in the light of consumer satisfaction. The sample for <2KW load category is shown below in Exhibit No. 9.7.

Exhibit No. 9.7: Preference of Consumer for Service Provider



This leads to the conclusion that restructuring is a necessary but not a sufficient condition for turnaround of the power sector. It is important to note that restructuring is only the beginning and not the end of the process. It must be accompanied by continuous complementary efforts to enhance efficiency in the sector and improve the Quality of Service to consumers.

Objective 4: To provide suggestions for improving the quality of Service in the power distribution from the consumer point of view

As per the analysis of data and in continuation of objective 3 leads to the conclusion is that in the three DISCOMs across the load categories, load shedding, metering and billing emerge as the major concerns of the consumers.

The study concludes that following concerns should be looked into:

- **Concern for Load Shedding:** Based on the priority of concerns given by the consumers, it is quite evident that load shedding needs the immediate attention of the DERC and utility service providers. Prior information on load shedding and reduction in the duration of cuts could possibly be looked into.
- **Concern for Metering:** The consumers find metering to be the second major concern, the service providers could possibly look into all viable options within the provision of their framework to improve the issue of 'metering' that would in turn enhance the satisfaction level of the consumers in this context.

Awareness Generation: In view of the low levels of awareness priority to awareness generation of 'redressal mechanisms' needs to be given so that consumers are more pro regarding DERC and CGRF among the consumers. It is essential to give adequate advice in addressing utility related concerns. This would play a substantial role in improving the overall satisfaction levels of the consumers with respect to the utility at a generic level and the respective DISCOM and redressal mechanism(s) at a specific level.

Road Ahead

Discoms to self regulate in maintenance of standards automatic compensation to be dispensed for violation of standards, empowerment of CGRFs/Ombudsmen for their effective functioning, massive consumer awareness programmes through Print/Audio Visual media has to be done. Engagement of consumer counsel in Tariff/PPA/License Proceedings, Follow up on training of field staffs of Discoms & consumer organizations ,frequent consumer interface & networking with consumer right groups ,case tracking through interactive website are some major steps to be taken by the regulator and distribution licensees.

Making the distribution system industry efficient is a key to the success of power sector reforms. Therefore, the Regulatory Commission needs to strike the right balance between the requirement of commercial viability of distribution licensees and consumers' interest. There is an urgent need to ensure sustainable improvement in the quality of service,

Frequent consumer interface & networking with consumer rights groups needed. Case tracking through interactive website suggested. Licensees do not accept complaints easily so CGRF should directly intervene in such cases. DERC should employ consultants to examine whether licensees are operating within the prescribed standards. Rule books should be provided with new electricity connections.

Also the key conclusion of the research are:

- Strong and sustained political support during all phases of restructuring is the key. Taking the employees into confidence and enlisting their willing support and strengthening the institution of Electricity Regulators are critical factors for success and sustainability of power sector reforms.
- Most of the GENCOs, TRANSCOs and some of the DISCOMs have now become financially viable. Consequently, they are able to attract additional investments and better technological and managerial interventions.
- It has been noticed that most of the restructured utilities are beaming positive trends in respect of key parameters wherever reasonable autonomy has

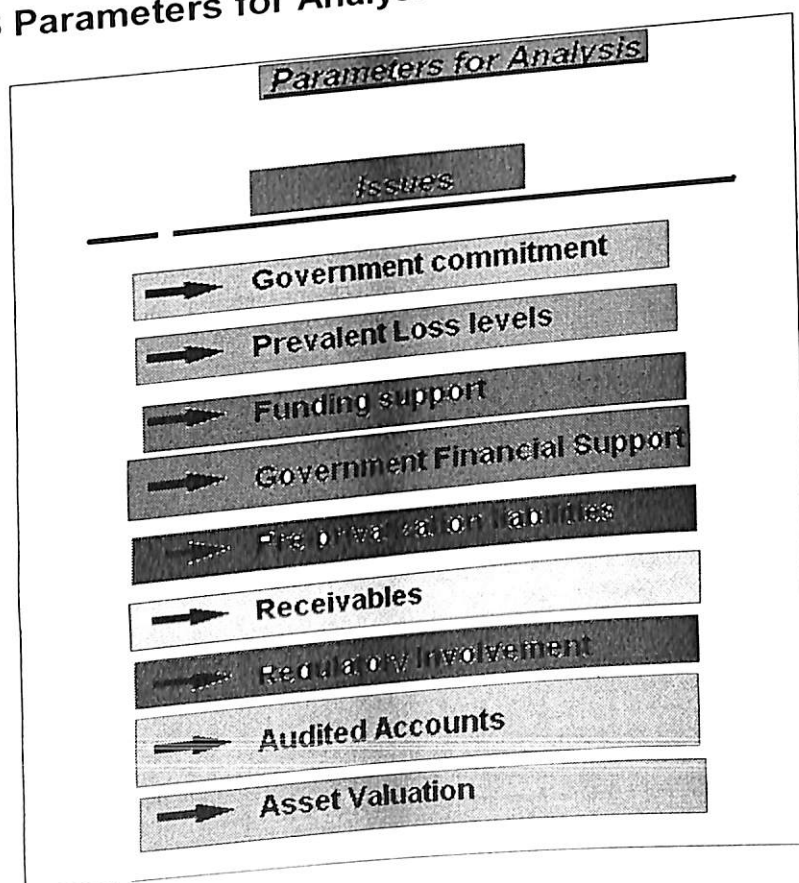
been provided to them. Restructuring has brought in the required accountability in the power sector triggering improved performance. Such positive correlation needs to be further reinforced through well designed systems and adoption of best practices on a continuing basis.

- Restructuring should not be misconstrued as privatization. It requires demystification, aggressive education and creation of a strong constituency to preserve, promote and develop the essence of restructuring. For ensuring that consumers get high quality services from utilities over a range of parameters and for bringing in operational efficiency, the regulations should provide for standards of performance specifying therein the type of supply failure.

Objective 5: To study the possibilities of replication in case of other states

The Delhi reform process had the preceding experience of the reform process undertaken in the States of Orissa and Andhra Pradesh. The experience of the three states were analyzed based on the parameters as shown in Exhibit No. 9.8 and in Chapter 8.

Exhibit No 9.8 Parameters for Analysis of Distribution experiences



The study of reforms experiences of Delhi, Orissa and Andhra Pradesh brings out the following lessons and concludes that:

- The change in management culture and the commercial orientation has led to assist in reducing losses and the benefits gained due to higher efficiencies would help reduce the consumer tariffs in the long run and improve the quality of service, as happened in several countries.
- There are a wide variety of business opportunities available for private sector.
- The government also needs to prove its commitment to reforms in terms of political will and support for rationalization of subsidies and action against theft, with legal framework.
- Finally, the most significant factor affecting investor sentiment is the regulatory framework.

These pioneering efforts have offered valuable lessons for other states who are embarking on reforms. The Government of Delhi deserves all the credit for improving on the experiences from Orissa and Andhra Pradesh for showing the way for other reforming states.

RECOMMENDATIONS FOR FURTHER STUDY

Making the distribution system industry efficient is a key to the success of power sector reforms. Therefore, the Regulatory Commission needs to strike the right balance between the requirement of commercial viability of distribution licensees and consumers' interest.

The important recommendations have been categorized for the use of the intended stakeholders as 'Way Forward'. The major recommendations are as follows:

- Need for sustained political commitment and support for the reform;
- Need to issue Detailed Policy Statements (DPS) to spell out the future policy and programmes;
- Need for an effective and forceful communication strategy;

- Need to make available excellent, competent consultancy support to the State Governments;
- Suggestions for managing the reform process;
- Suggestions to make the regulatory mechanism more effective;
- Need for the Central Government to support Power Sector Reform Funds;
- Increasing the accountability and autonomy of the Utilities by private/employees' participation in the equity base, appointment of independent directors, etc.;
- Reducing cross-subsidies through political commitment; and
- Introducing various measures, this would improve efficiency and productivity of Utilities.

Following are some the key concerns that need immediate attention for the domestic consumers.

In order to improve the Quality of service the following factors need to be focused on:

In view of the low levels of awareness regarding DERC and CGRF among the consumers, it is essential to give adequate priority to awareness generation of 'redressal mechanisms' so that consumers are more pro active in addressing.

Massive consumer awareness programmes through Print/Audio-Visual media may be thought of. Follow up on training of field staffs of DISCOMs & consumer organizations required. Simplified procedures of addressing consumer grievances should be circulated among consumers. Consumer meets should be organized at district level. Regulations should be discussed in every level. Interface between Consumers and Licensees is very vital. The new Mantra for the distribution utilities should be customer relationship management.

This would play a substantial role in improving the overall satisfaction levels of the consumers with respect to the utility at a generic level and the respective DISCOM and redressal mechanism(s) at a specific level.